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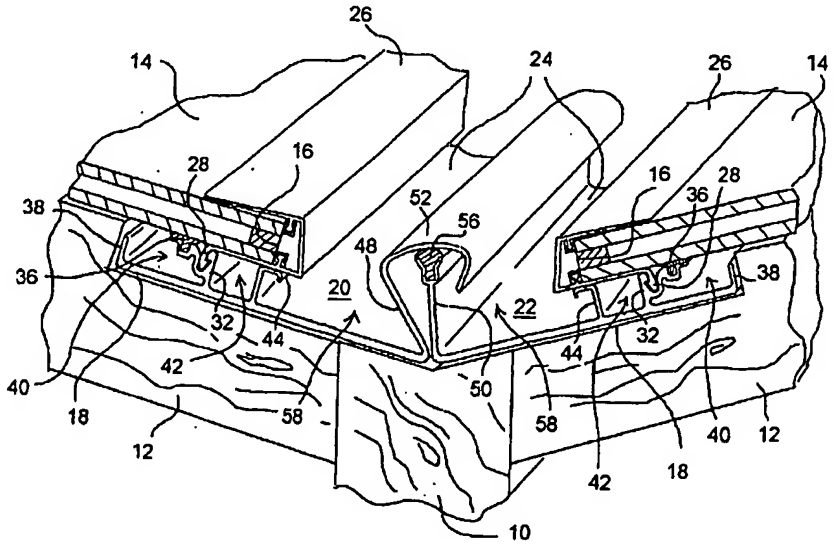
(54) Abstract Title
Valley gutter assembly

(57) A roof comprises a valley rafter (10) and a plurality of jack rafters (12) inclined downwardly to each side of the valley rafter. First and second gutter members (20 and 22) are fixed substantially parallel to the valley rafter along the lower ends of the jack rafters either side of the valley rafter. Each gutter member (20 and 22) supports the lower edge of at least one downwardly inclined glazing panel (14) disposed on the jack rafters on the respective side of the valley rafter. The adjacent longitudinal edges of the gutter members comprise upstanding arms (48 and 50) of which one arm (48) forms an arch (52) extending freely over the other arm (50). A seal (56) is carried at the free end of the inner arm (50) engaging the inside surface of the arch (52).

Fig. 2



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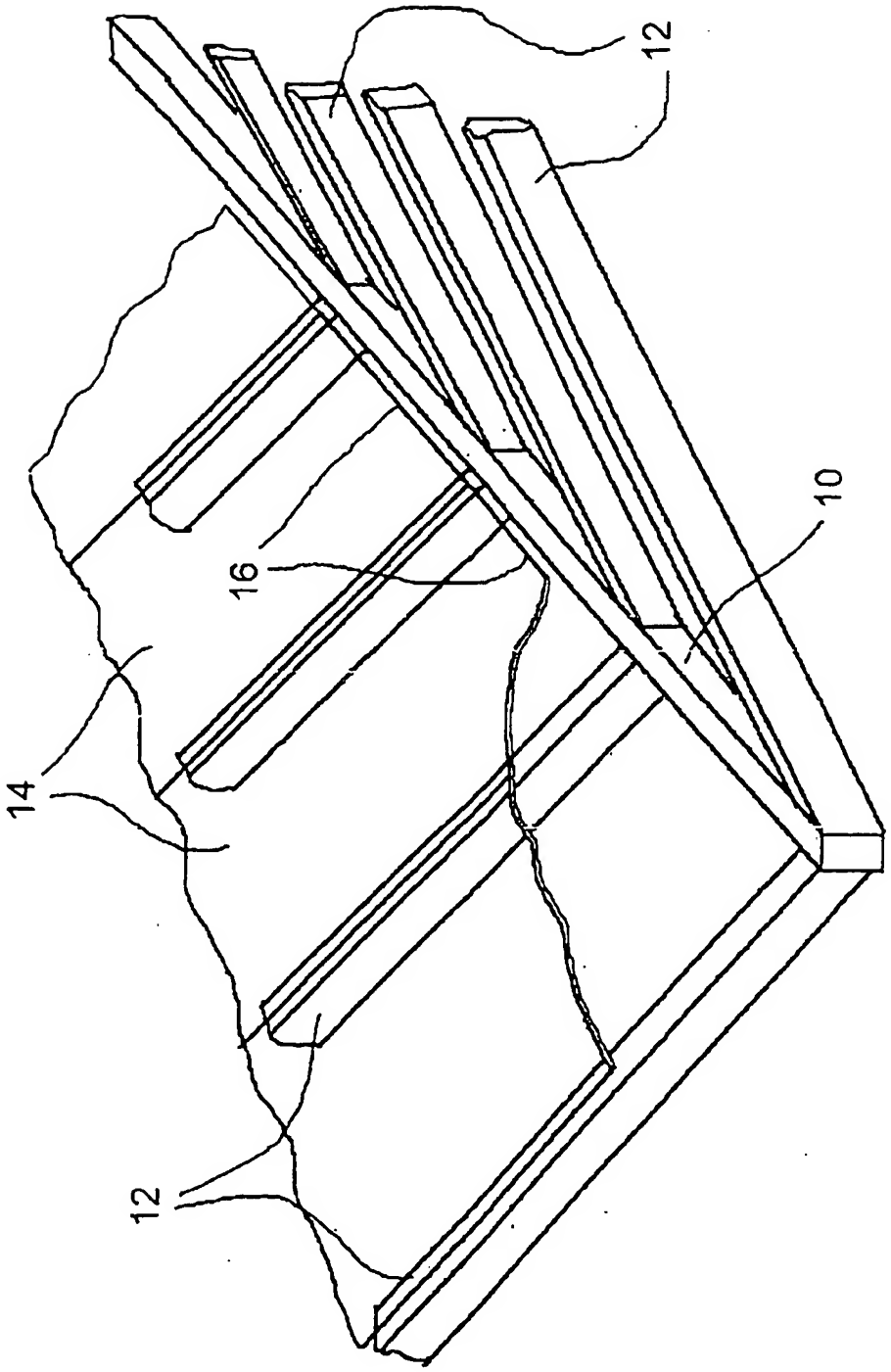
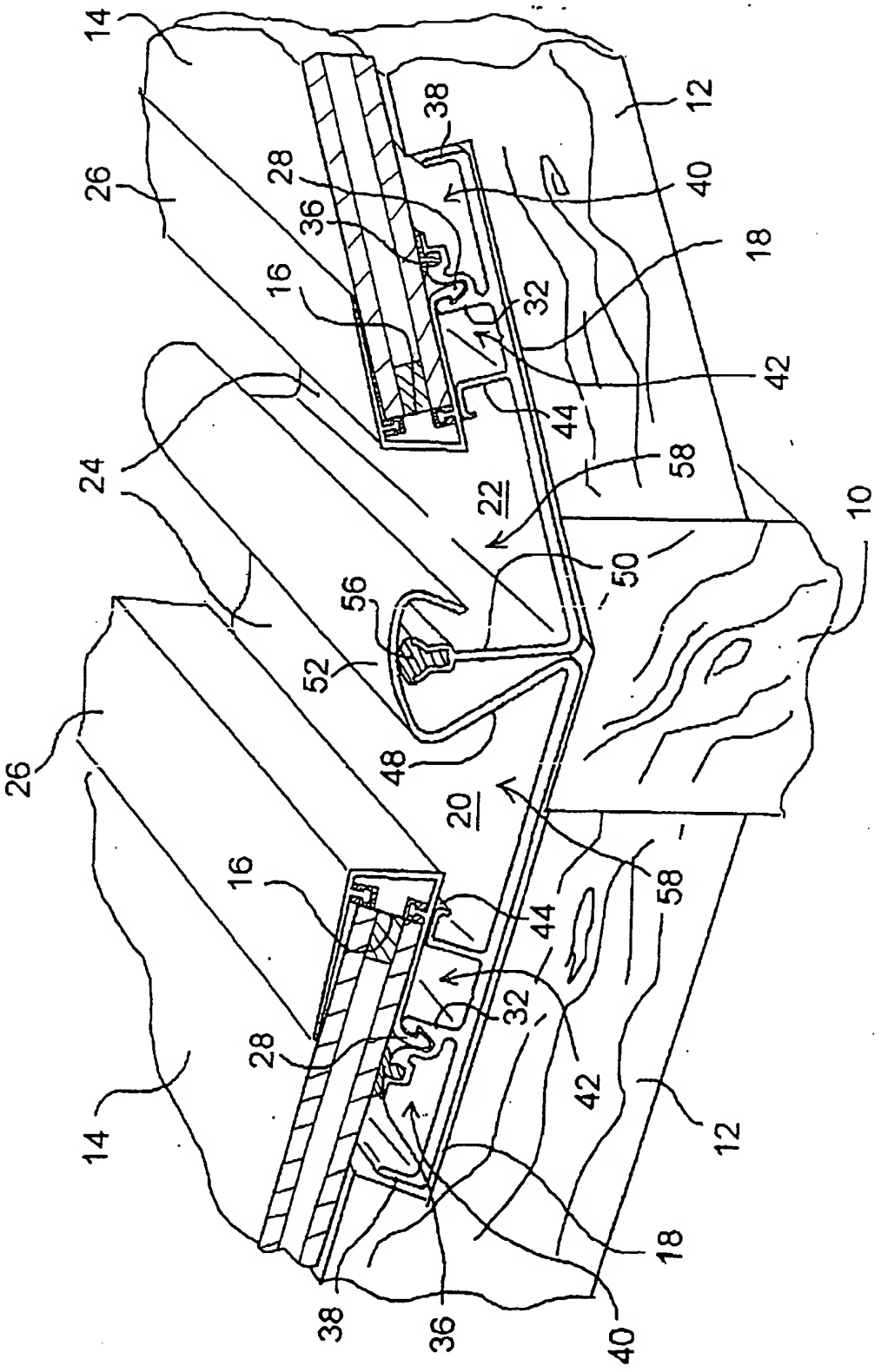


Fig. 1

Fig. 2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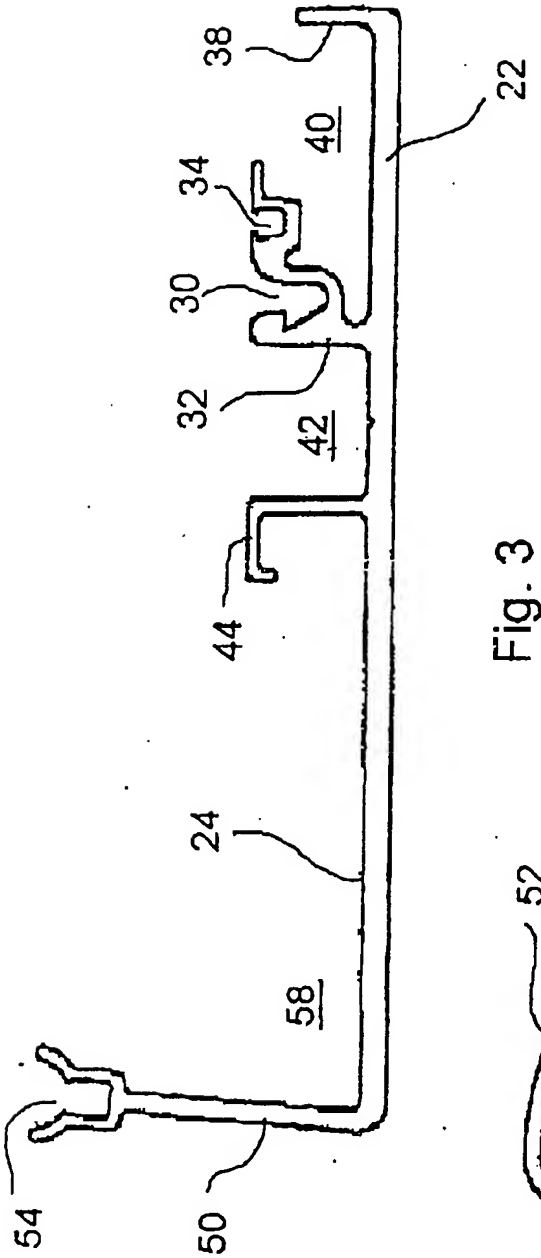

Fig. 3

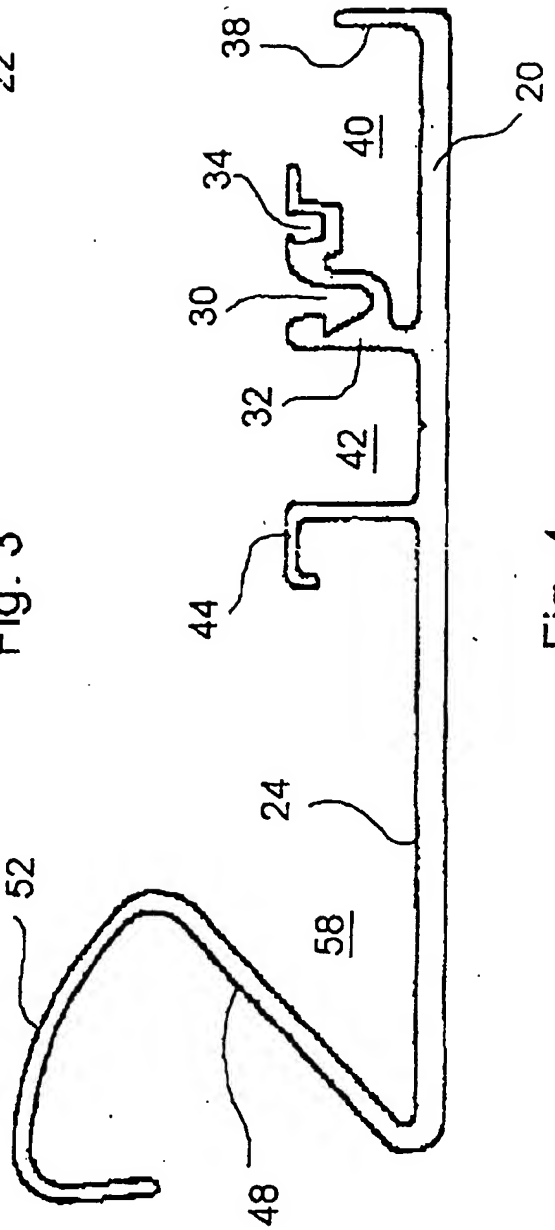

Fig. 4

A ROOF INCLUDING A VALLEY GUTTER

This invention relates to a roof including a valley gutter.

Fig. 1 is a partial cut-away view of a typical valley in a prefabricated roof. The valley is defined by a valley rafter 10 and a plurality of substantially parallel jack rafters 12 inclined downwardly to meet the valley rafter 10 on each side. A plurality of glazing panels, such as double glazed units 14, are supported by their opposite edges on the jack rafters 12 in known manner so that they span the gaps between adjacent rafters 12. Since the panels 14 follow the slope of the rafters 12, they too are downwardly inclined towards the valley rafter 10 and their lower edges 16 are disposed adjacent and substantially parallel to the valley rafter 10. Although Fig. 1 shows glazing panels 14 on only one side of the valley rafter 10, it will be understood that similar panels are likewise disposed on the jack rafters 12 on the other side of the valley rafter.

In such valley constructions, it is necessary to construct a weather-sealed gutter along the length of the valley for the drainage of rainwater falling from the lower edges 16 of the glazing panels 14. However, the pitch of the jack rafters 12 is typically anything from 15-45 degrees, so that the valley angle may correspondingly vary from structure to structure. This leads to difficulties in using standardised components to cope with a wide range of valley angles.

It is therefore an object of the invention to provide a roof structure including a valley gutter whose components are capable of accommodating a range of valley angles.

According to the present invention there is provided a roof including a valley gutter, the roof comprising a valley rafter, a plurality of further rafters inclined downwardly to the valley rafter on each side thereof, and first and second elongate gutter members disposed substantially parallel to the valley rafter along the lower ends of the further rafters respectively on each side of the valley rafter, each gutter member supporting the lower edge of at least one downwardly inclined glazing panel disposed on the further rafters on the respective side of the valley rafter, wherein the adjacent longitudinal edges of the gutter members comprise respective upstanding arms of which one forms an arch extending freely over the other, the roof further including sealing means between the said other arm and the inside surface of the arch.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1, previously described, is a partial cut-away view of a typical valley in a prefabricated roof;

Fig. 2 is a cross-section through a roof including a valley gutter according to an embodiment of the invention; and

Figs. 3 and 4 are, respectively, cross-sectional views of two of the components used in the construction of Fig. 2.

Referring to Figs. 2 to 4 of the drawings, a roof includes a valley defined by a valley rafter 10 and a plurality of jack rafters 12 on each side as described for Fig. 1 (in Fig. 2 only one jack rafter 12 is shown on each side of the valley rafter 10). The lower end of each jack rafter 12 is recessed, the floor of the recess 18 being level with the upper surface of the valley rafter 10 which is a shallow "V" shape corresponding to the angle between the jack rafters 12.

First and second elongate gutter members 20 and 22 respectively, each of substantially constant cross-section and preferably made by extrusion of aluminium or other lightweight metal, are disposed substantially parallel to the valley rafter 10 along the lower ends of the jack rafters 12 on each side of the valley rafter. In this embodiment, each gutter member 20, 22 includes a base plate 24 which runs along the recesses 18 and extends laterally onto the upper surface of the valley rafter 10, the adjacent longitudinal edges of the base plates 24 abutting or being in close proximity at the centre of the valley rafter as seen in Fig. 2. The gutter members 20 and 22 run substantially the full length of the valley rafter 10 and are fixed in position by a series of screws (not shown) which pass through the base plate 24 into the jack rafters 12 along a screw fixing channel 42.

On each side of the valley rafter 10 the lower edges 16 of the glazing panel 14 are supported and retained in position by a respective resilient channel member or clip 26 running along the full length of the gutter members 20 and 22. The clip 26 resiliently engages the lower edges 16 of the panels 14 on the respective side of the valley rafter 10 and, in this embodiment, is the same as the clip described with reference to Figs. 3 and 4 of our copending Irish Patent Application No. 2000/0862. On its underside each clip 26 has a downturned hook-like formation 28 which engages a corresponding recess 30 in an upstanding anchoring member 32 integral with the base plate 24, thereby preventing the panels 14 from sliding downwardly towards the valley rafter 10. At its forward end each clip 26 rests on an upstanding support element 44 integral with the base plate 24 and defining with the anchoring member 32 the screw fixing channel 42.

Each anchoring member 32 also has a recess 34 holding a resilient seal 36 which engages the underside of the glazing panels 14 on the side of the anchoring member 32 remote from the valley rafter 10. The anchoring member 32 and the portion of the base plate 24 remote from the valley rafter 10, together with an upstanding wall 38 at the rear edge of the base plate 24, define a condensation channel 40 for moisture running down the underside of the glazing panels 14 and deflected into the channel 40 by the resilient seal 36..

The adjacent longitudinal edges of the base plates 24 of the gutter members 20, 22 comprise respective upstanding arms 48, 50 extending the full length of the

valley rafter 10. The arm 48 forms an arch 52 which extends freely over the other arm 50. In particular, in this embodiment, the inside surface of the arch 52 conforms to a part of the circumference of a cylinder whose centre of radius is approximately at the base of the arm 50, the latter extending substantially radially relative to the inside surface of the arch 52. The free upper end of the arm 50 has a recess 54 which holds a resilient silicone rubber seal 56 engaging the inside surface of the arch.

It will be evident that this configuration of the arms 48 and 50 allows a range of valley angles to be accommodated, since the arm 50 can assume a range of radial positions relative to the arch 52 with the seal 56 engaging the inside surface of the arch.

The invention is not limited to the embodiment described herein which may be modified or varied without departing from the scope of the invention.

CLAIMS

1. A roof including a valley gutter, the roof comprising a valley rafter, a plurality of further rafters inclined downwardly to the valley rafter on each side thereof, and first and second elongate gutter members disposed substantially parallel to the valley rafter along the lower ends of the further rafters respectively on each side of the valley rafter, each gutter member supporting the lower edge of at least one downwardly inclined glazing panel disposed on the further rafters on the respective side of the valley rafter, wherein the adjacent longitudinal edges of the gutter members comprise respective upstanding arms of which one forms an arch extending freely over the other, the roof further including sealing means between the said other arm and the inside surface of the arch.

2. A roof as claimed in claim 1, wherein the inside surface of the arch is substantially partially cylindrical, and wherein the said other arm extends substantially radially relative to the inside surface of the arch.

3. A roof as claimed in claim 1 or 2, wherein the sealing means comprises a sealing member held by the said other arm and engaging the inside surface of the arch.

4. A roof as claimed in any preceding claim, wherein on each side of the valley rafter the lower edge of the respective glazing panel is embraced by a respective

channel member which is anchored to the gutter member on that side of the valley rafter.

5. A roof as claimed in any preceding claim, wherein each gutter member includes a base plate disposed along the ends of the respective further rafters, the base plate and the associated upstanding arm defining a respective drainage channel for rainwater falling from the lower edge of the glazing panels anchoring section.

6. A roof as claimed in claim 5 when dependent on claim 4, wherein each base plate includes an upstanding anchoring member for the respective channel member, the anchoring member also holding a seal which engages the underside of the glazing panel on the side of the anchoring member remote from the upstanding arm, the base plate and anchoring member defining a condensation channel for moisture running down the underside of the glazing panel.

Application No: GB 0101221.0
Claims searched: 1-6
Examiner: Matthew Cope
Date of search: 21 March 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): E1D: DDJ, DF172

Int Cl (Ed.7): E04D

Other: ONLINE: EPODOC, WPI, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2335674 A (CDW PRODUCTS)	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.